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[54] **PRETREATMENT PROCESS FOR
CONVERSION OF CELLULOSE TO FUEL
ETHANOL**

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[56] **References Cited**
U.S. PATENT DOCUMENTS
4,752,579 6/1988 Arena et al. 435/99

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[57] **ABSTRACT**

An improved pretreatment of cellulosic feedstocks, to enable economical ethanol production by enzyme treatment. The improved pretreatment comprises choosing either a feedstock with a ratio of arabinoxylan to total nonstarch polysaccharides (AX/NSP) of greater than about 0.39, or a selectively bred feedstock on the basis of an increased ratio of AX/NSP over a starting feedstock material, and reacting at conditions that disrupt the fiber structure and hydrolyze a portion of the cellulose and hemicellulose. This pretreatment produces a superior substrate for enzymatic hydrolysis, by enabling the production of more glucose with less cellulase enzyme than any known procedures. This pretreatment is uniquely suited to ethanol production. Preferred feedstocks with an AX/NSP level greater than about 0.39 include varieties of oat hulls and corn cobs.

58 Claims, 2 Drawing Sheets